REMARKS

Claims 1-8 are pending in this application. By this amendment, Applicant amends claims 2 and 4.

The drawings were objected to for being too faint. Applicant submits herewith formal drawings. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this objection.

Claim 2 was rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Applicant has amended claim 2 to correct the informality noted by the Examiner. Claim 4 has been amended to correct the same informality noted in claim 2. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claims 1 and 5-8 were rejected under 35 U.S.C. § 102(b) as being anticipated by Murata et al. (JP 59-057166). Claim 2 was rejected under 35 U.S.C. § 102(b) as being unpatentable over Cullen (U.S. 4,346,597). Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Murata et al. in view of Watanabe (U.S. 5,838,091). And claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Cullen in view of Watanabe. These rejections are respectfully traversed.

Claim 1 recites:

> "An acceleration sensor comprising a bimorph type acceleration detection element including **a pair of surface acoustic wave resonators coupled to each other with the back surface of one resonator bonded to the back surface of the other resonator**, wherein **each resonator includes a piezoelectric substrate and a pair of IDT electrodes which are arranged on the front surface of said piezoelectric substrate**,
>
> wherein said acceleration detection element is supported at an end thereof such that said acceleration detection element is deflected in the thickness direction of the piezoelectric substrate under acceleration, and
>
> wherein **acceleration is detected by differentially detecting a frequency change or an impedance change of said two surface acoustic wave resonators which is caused by the deflection of the acceleration detection element**." (Emphasis added)

Claim 3 recites features that are similar the features recited in claim 1, including the emphasized features.

The Examiner alleged that Murata et al. teaches all of the features recited in claim 1, including "a pair of surface acoustic wave resonators (3, 4) coupled to each other with the back surface of one resonator bonded to the back surface of the other resonator". Applicant respectfully disagrees.

In contrast to the present claimed invention and the Examiner's allegations, Murata et al., Figs. 1 and 2, teaches only **a single** surface acoustic wave resonator including two reflectors sandwiching a single IDT 2 with only one input 3 and one output 4. Since Murata et al. clearly teaches only a **single** input 3 and a **single** output 4, by definition, Murata et al. teaches a **single** surface acoustic wave resonator. Thus, Murata et al. clearly fails to teach or suggest "a pair surface acoustic wave resonators", and certainly fails to teach or suggest "a pair of surface acoustic wave resonators coupled to each other with the back surface of one resonator bonded to the back surface of the other resonator, wherein each resonator includes a piezoelectric substrate and a pair of IDT electrodes which are arranged on the front surface of said piezoelectric substrate" as recited in the present claimed invention.

Furthermore, since Murata et al. teaches only a **single** surface acoustic wave resonator, Murata et al. clearly fails to teach or suggest "acceleration is detected by differentially detecting a frequency change or an impedance change of said two surface acoustic wave resonators which is caused by the deflection of the acceleration detection element" as recited in the present application.

Watanabe is relied upon merely to teach a glass substrate, and certainly fails to teach or suggest "a pair of surface acoustic wave resonators coupled to each other with the back surface of one resonator bonded to the back surface of the other resonator, wherein each resonator includes a piezoelectric substrate and a pair of IDT electrodes which are arranged on the front surface of said piezoelectric substrate" and "acceleration is detected by differentially detecting a frequency change or an impedance change of said two surface acoustic wave resonators which is caused by the deflection of the acceleration detection element" as recited in the present claimed invention.

Accordingly, Applicant respectfully submits that Murata et al. and Watanabe, applied alone or in combination, fail to teach or suggest the unique combination and

arrangement of elements recited in claims 1 and 3 of the present application.

Claim 2 has been amended to recite:

> "An acceleration sensor comprising an acceleration detection element including **two surface acoustic wave resonators which include a single piezoelectric substrate, and a pair of IDT electrodes arranged on each of the front and back surfaces of said piezoelectric substrate**,
>
> wherein said acceleration detection element is supported at an end thereof such that said acceleration detection element is deflected in the thickness direction of the piezoelectric substrate under acceleration, and
>
> wherein **acceleration is detected by differentially detecting a frequency change or an impedance change of said two surface acoustic wave resonators which is caused by the deflection of the acceleration detection element**." (Emphasis added)

Claim 4 recites features that are similar to the features recited in claim 2, including the emphasized features.

The Examiner alleged that Cullen teaches all of the features recited in claim 2 of the present application, including "two surface acoustic wave resonators (34) including a pair of IDT electrodes arranged one each of the front and back surface of said piezoelectric substrate (12)." Applicant respectfully disagrees.

In contrast to the present claimed invention and the Examiner's allegations, Cullen teaches only a **single** surface acoustic wave resonator. Cullen specifically teaches in col. 3, lines 1-7, "to read the acceleration-induced flexure of the beam 12, the strain in the surfaces of the beam is monitored by means of **a surface acoustic wave resonator**" (emphasis added). Thus, Cullen clearly fails to teach or suggest "two surface acoustic wave resonators which include a single piezoelectric substrate, and a pair of IDT electrodes arranged on each of the front and back surfaces of said piezoelectric substrate" and that "acceleration is detected by differentially detecting a frequency change or an impedance change of said two surface acoustic wave resonators which is caused by the deflection of the acceleration detection element" as recited in the present claimed invention.

The Examiner alleged that element 34 of Cullen is a surface acoustic wave resonator. However, this is clearly incorrect. Element 34 of Cullen is specifically

disclosed as being a metallization 34 for connecting a transducer 20 to a pad 36, and thus, is clearly **not** a surface acoustic resonator.

Watanabe is relied upon merely to teach a glass substrate, and certainly fails to teach or suggest "a pair of surface acoustic wave resonators coupled to each other with the back surface of one resonator bonded to the back surface of the other resonator, wherein each resonator includes a piezoelectric substrate and a pair of IDT electrodes which are arranged on the front surface of said piezoelectric substrate" and "acceleration is detected by differentially detecting a frequency change or an impedance change of said two surface acoustic wave resonators which is caused by the deflection of the acceleration detection element" as recited in the present claimed invention.

Accordingly, Applicant respectfully submits that Cullen and Watanabe, applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in claims 2 and 4 of the present application.

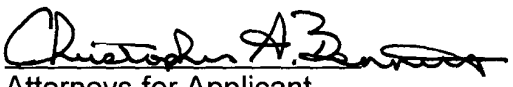
In view of the foregoing amendments and remarks, Applicant respectfully submits that claims 1-4 are allowable. Claims 5-8 depend upon claim 1, and are therefore allowable for at least the reasons that claim 1 is allowable.

In view of the foregoing Remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are respectfully solicited.

To the extent necessary, Applicant petitions the Commissioner for a One-month extension of time, extending to February 28, 2003, the period for response to the Office Action dated October 31, 2002.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,



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VERSION WITH MARKINGS SHOWING CHANGES MADE

2. (amended) An acceleration sensor comprising a<u>n</u> [bimorph type] acceleration detection element including two surface acoustic wave resonators which include a single piezoelectric substrate, and a pair of IDT electrodes arranged on each of the front and back surfaces of said piezoelectric substrate,

wherein said acceleration detection element is supported at an end thereof such that said acceleration detection element is deflected in the thickness direction of the piezoelectric substrate under acceleration, and

wherein acceleration is detected by differentially detecting a frequency change or an impedance change of said two surface acoustic wave resonators which is caused by the deflection of the acceleration detection element.

4. (amended) An acceleration sensor comprising a<u>n</u> [bimorph type] acceleration detection element including two surface acoustic wave resonators, which include a single glass substrate, a pair of IDT electrodes arranged on each of the front and back surfaces of said glass substrate, and a piezoelectric film which is deposited on said glass substrate including said IDT electrodes thereon,

wherein said acceleration detection element is supported at an end thereof such that said acceleration detection element is deflected in the thickness direction of the glass substrate under acceleration and,

wherein acceleration is detected by differentially detecting a frequency change or an impedance change of said two surface acoustic wave resonators which is caused by the deflection of the acceleration detection element.